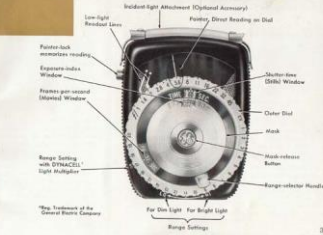


YOUR G-E GOLDEN CROWN EXPOSURE METER

You will enjoy using your new G-E GOLDEN CROWN exposure meter, for this meter can show you—in 6 seconds or less—the exact lens setting for perfectly exposed pictures.

No other exposure meter can match the GOLDEN CROWN for versatility, sensitivity, and ease of use. Such features as direct reading, pointer-lock action, and lifetime accuracy, together with optional accessories make it the finest that money can buy.

Read the following instructions carefully and learn how easy it is to get exact lens settings with the GOLDEN CROWN. Regardless of the kind of camera you own, you will find that you are completely equipped to take pictures you will be proud to show.



DETAILED OPERATING INSTRUCTIONS

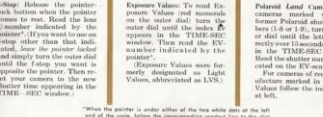


EXP-Wind Window
From the mark-release button on the meter dial until the exposure index for your film appears in the EXP-WIND window. The correct exposure-index for your film is given in the instructions sheet enclosed with the film. The mark-release button must be used frequently and must be used in the dark. When taking pictures in daylight, use the daylight index; when artificial light, use the tungsten index.

Color Dial
T-STOP Window for Manual
Turn the outer dial to the mark-release button. The correct exposure-index for your film is given in the instructions sheet enclosed with the film. The mark-release button must be used frequently and must be used in the dark. When taking pictures in daylight, use the daylight index; when artificial light, use the tungsten index.

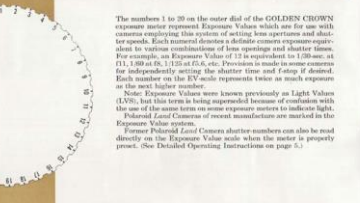
Range-selector Handle
Range-selector handle in the position shown in the diagram. The correct exposure-index for your film is given in the instructions sheet enclosed with the film. The mark-release button must be used frequently and must be used in the dark. When taking pictures in daylight, use the daylight index; when artificial light, use the tungsten index.

Pointing-lock
Release the pointing-lock button when the pointer comes to rest. Read the lens exposure in the TIME-SEC window. If you want to use an exposure other than that indicated, lower the pointer knob and study the meter dial until the f-stop you want is opposite the pointer. Then reset your camera to the new shutter time appearing in the TIME-SEC window.

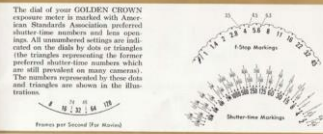


"When the pointer is under either of the two white dots at the left and at the center, before the corresponding reading in the dial is taken the proper exposure setting."

EXPOSURE-VALUE SCALE (Light Values)

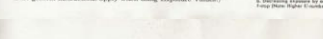


SHUTTER TIME AND T-STOP DIAL



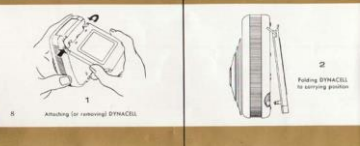
EXPOSURE INCREASE OR DECREASE

As you will see later in this book, there are certain unusual conditions when your photograph can be improved by increasing or decreasing the exposure from that indicated by the meter. The outer dial of your GOLDEN CROWN is designed to assist you in finding this exposure adjustment at a glance. The "stop" of the outer dial are equally spaced, one full stop apart. The illustrations at right show how to increase or decrease the exposure. (Note: The same general instructions apply when using Exposure Values.)



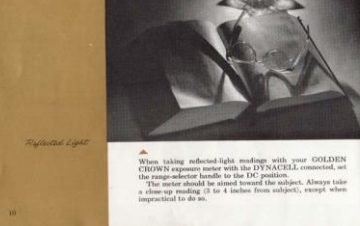
DYNACELL

The DYNACELL is an accessory to your GOLDEN CROWN, for obtaining greater sensitivity in dim light (when the pointer on the meter does not move far enough to obtain a reading) it is attached to the GOLDEN CROWN at all times. It holds fast against the back of the meter for ease in carrying. In this position



It is automatically disconnected so that the meter can be used for normal sensitivity. To increase the sensitivity, the DYNACELL is simply raised into the operating position. The GOLDEN CROWN with the DYNACELL is designed to measure reflected light. If it is desired to measure incident light, see the instructions included with the DYNACELL. The illustrations below show how to attach and use the DYNACELL. Additional details concerning its use are given on page 10.

DYNACELL



REFLECTED VS INCIDENT LIGHT

There are two methods of thought on the use of a meter in measuring exposures. Some prefer to measure reflected light and others incident light. Through extensive tests, it has been found that each method has definite advantages and limitations.

In general, for outdoor scenes, the reflected-light method is considered to be more dependable. For small objects, medium and for indoor pictures with artificial light, the incident-light method is preferred.

Your GOLDEN CROWN can measure either with equal ease. By simply placing the incident-light attachment on accessory on your meter, you change it from a reflected-light meter to an incident-light meter.

In the following sections you will see illustrations of the different methods for taking light readings.



Methods of Taking REFLECTED-LIGHT READINGS





Substituted Method
When the subject is inaccessible and a direct reading is desired, take the reading on a substitute object of similar characteristics and smaller light. If the point of the hand is used as a substitute, hold the meter 2 to 4 inches from the hand and take a reading.

Scanning the Brightness Range
In scenes having a wide range of light and dark areas, it is sometimes desirable to use the average exposure, particularly in black-and-white photography. Take readings on the lightest and darkest objects in the scene, and choose an f-stop or Exposure Value half way between the extreme readings. Your GOLDEN CHROWN can also be used to determine the brightness range in terms of f-stops or Exposure Values.



Exposure Meter

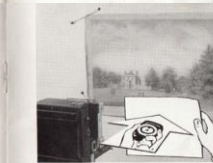
Determine this range as follows:
1. Take a reading on the darkest object and note the value dial set Exposure Value 1 opposite the pointer.
2. Take a reading on the lightest object. Change range if necessary.
3. Subtract 1 From the Exposure Value indicated by the pointer. This is the range in f-stops or Exposure Values. If desired, the f-stop or Exposure Value

range may be converted to the brightness range as indicated in the table below:

f-stop or Exposure Value Range	Brightness Ratio
1	2:1
2	4:1
3	8:1
4	16:1



Darker and Lighter Object Methods for Contrasty Scenes
To record as many tone values as possible in a contrary scene having deep shadows, a compromise exposure can be used. If the shadow area is more important, aim the meter at that part of the scene, and decrease the exposure indicated by the meter by using the third lower f-number or EV number for black-and-white, or by using the second lower f-number or EV number for color. Although the highlights in the scene will be underexposed, but not enough to be blocked up, and many tones in the highlight area will be recorded rather than just the overexposure. Conversely, if the highlight area is more important, aim the meter at that part of the scene, and then increase the exposure indicated by the meter by using the third lower f-number or EV number for black-and-white, or by using the second lower f-number or EV number for color. If the highlights are somewhat overexposed, they will be rendered essentially black, and many of the darker tones will also be recorded.



Exposure Meter

Copying
In making copies of documents or photographs in color or black and white, incident light by pointing the meter to take a close-up reading on a white card held against the copy. Divide the exposure-index by 8. Take readings with the card held at various points on the copy to check uniformity of illumination.



Methods of Taking INCIDENT-LIGHT READINGS

Usual Method
Use the incident-light attachment. Hold the meter at the center of interest of the subject and aim it toward the camera. To read the subject is inaccessible,

the incident light may be measured with the incident-light attachment. It is judged to be the scene, remembering that the direction of aiming the meter is always toward the camera, or in a parallel direction.



Exposure Meter

Key-light Method
In some cases it is desirable to measure incident light by pointing the meter toward the "key" or main light source instead of toward the camera.

Hold the meter as close to the subject as possible, as in a plane where illumination is the same. Aim toward the key light source and increase the indicated exposure by using the next lower f-number or the next lower EV number.



Exposure Meter

Lighting-contrast Method
It is frequently desirable to adjust the lighting contrast, that is, the ratio of "key" light to fill-in light. A ratio of between 2:1 and 4:1 is usually used. Your GOLDEN CHROWN can be used to measure the ratio as follows:
1. With the incident-light attachment in position, hold the meter near the subject (the forehead in portraits) and take a reading with the meter aimed at the film in light.
2. Rotate the meter dial to set Exposure Value 1 opposite the pointer.
3. Aim the meter directly at the key light and take a reading as before but do not move the meter dial.
4. Provided the key light is stronger than the fill-in light, as it should be, the number opposite the new pointer position can be used to determine the lighting ratio from the Table at right.

The corresponding numerical ratios are:

Number on Exposure Value Scale	Numerical lighting ratio
1	1:1
2	2:1
3	4:1
4	8:1



Exposure Meter

HOW TO ALLOW FOR FILTERS

There are two ways to allow for filter factors in using your GOLDEN CHROWN exposure meter.
1. When the same filter is to be used for a series of pictures, as frequently in the case in black and white photography, divide the exposure index for the film by the filter factor and set the result in the Exposure-Index window. The filter factor will then automatically be taken into account in your exposure measurements until the exposure-index setting is changed.
2. For occasional use, a filter factor generally is more conveniently applied to the final exposure-meter reading. Increase the exposure as indicated in the Table at right.

Filter Name	Exposure Increase as a % of Average Exposure Value
1/2	1%
2	1 1/2%
3	2%
4	2 1/2%
5	3%
6	3 1/2%

PRINCIPLES OF EXPOSURE

The three major factors which control exposure are:

- 1 Exposure Index**
Photographic film is manufactured in many types. The main difference between them affecting your exposure meter is sensitivity to light. The sensitivity rating of the film must be set on your meter before taking a measurement. The American Standards Association has assigned numbers for rating films according to their sensitivity to light. These numbers are called exposure-index numbers, which, numerically, are higher for the more sensitive film and lower for the less sensitive.
- 2 f-Stop**
The amount of light that is allowed to reach the film is controlled by the relative size of the camera lens opening. The relative lens opening, in most cameras, is adjustable and is set according to a numbering system. These settings indicate openings are called f-stops and are marked on your exposure meter and camera. f-stops are numerically higher for smaller relative openings and lower for larger relative openings; for example, f/2 admits 4 times as much light as f/4, and f/8 admits 4 times as much light as f/4.
- 3 Time (Shutter Speed)**
The amount of light which reaches the film is controlled by setting the f-stop on your camera. And since the f-stop setting does not vary, different shutter speeds admit the same relative amount of light when set at the same f-stop.

HOW TO ALLOW FOR FILTERS

There are two ways to allow for filter factors in using your GOLDEN CHROWN exposure meter.
1. When the same filter is to be used for a series of pictures, as frequently in the case in black and white photography, divide the exposure index for the film by the filter factor and set the result in the Exposure-Index window. The filter factor will then automatically be taken into account in your exposure measurements until the exposure-index setting is changed.
2. For occasional use, a filter factor generally is more conveniently applied to the final exposure-meter reading. Increase the exposure as indicated in the Table at right.

EXPOSURE HINTS

Exposure Hints
For most scenes in color and black and white photography, your GOLDEN CHROWN exposure meter will give the preferred exposure when aimed directly at the scene from the camera position. For certain unusual conditions, however, results can be improved by either increasing or decreasing the exposure from that indicated by the meter, depending upon the nature of the scene. Exposure for color film transparencies differs from that for ordinary negatives in that increased exposure makes the image lighter on the projection screen. This is often desirable to brighten the scene of a picture or to portray more naturally a light subject. Color can be controlled slightly by exposure. Less exposure increases color saturation, while more exposure reduces saturation and the colors tend toward neutral shades.
Especially bright scenes usually require proportionately more light and influence the exposure meter to indicate slightly less exposure than is actually desired.
The following are hints to assist you in obtaining preferred exposures for several scenes and lighting conditions.

Snow or Sky
To photograph a subject in a scene which includes mostly snow or sky, use the close-up method (see page 13), whenever possible. If readings must be taken from the camera position, a preferred exposure is usually obtained if the indicated exposure is increased by using the next lower f-number or the next lower EV number.
Overcast Scenes
For scenes in overcast or foggy weather there is more uniform lighting contrast. In such situations, the indicated exposure may be increased by using the next lower f-number or the next lower EV number. With black-and-white transparencies, this may be obtained by decreasing the indicated exposure by using the next higher f-number or the next higher EV number.
Back-lit Subject
For back-lit subjects close-up readings are preferred. Direct sunlight should be prevented from shining into the meter. However, for scenes, aim the meter directly at the scene and use the exposure indicated by the meter.
Fog and Mist
A scene which is a combination of fog and mist is similar to overcast or foggy scenes, where the atmosphere is bright compared to foreground objects. For color photography, increase the exposure indicated by the meter by using the next lower f-number or the next lower EV number. For black-and-white, decrease the exposure by using the next higher f-number or the next higher EV number.
Mistaken-Flash Outdoors
In outdoor photography, especially of back-lit subjects, atmospheric haze is used to reduce or increase lighting contrast between the foreground and background objects. For the combination of



film, lens, and shutter time, find the guide number on the photoflash lamp chart. Aim the meter at the scene and determine the f-stop. Then divide the photoflash guide number by this f-number to get lamp distance from subject.

If the distance found is too great for convenience, cover the flash reflector with a handkerchief and advance the lamp 1/2 of the way to the subject.

Television

Use a tripod for the camera and adjust the TV range for best brightness and contrast. Focus on the lines across the screen, rather than the image itself.

Set the shutter for 1/30 second. Then the room lights. Hold the meter about 1/2 screen diameter from the set and obtain an average exposure reading.

Aerial Pictures

Aim the meter toward the ground and

for other photography measure the indicated exposure by using the next lower f-number or the next lower EV number. Pictures taken on color film from high altitudes are improved by use of a warm-colored filter to reduce the blue haze.

Other Special Uses

Projection-Screen Brightness

To obtain the best possible projected image, your screen should reflect 9 to 14 footcandles (with no slide in the projector). Measure screen brightness by holding the meter light-cell against the center of the illuminated screen and then drawing the meter (set for L2) range away from the screen until the maximum reading is obtained. Convert the scale reading to footcandles. See Scale Equivalents on page 28. Move the projector lens or screen from the screen as required to adjust the brightness.


TECHNICAL DATA

Scale Equivalents

When using the incident-light attachment, the GOLDEN CROWN exposure meter measures the quantity of illumination falling on an object or scene. This can be expressed in footcandles by use of the tables given on the following page.

Any object or scene absorbs some of the light which falls on it, and reflects the remainder. The percent that is reflected is called the reflectance of the subject. Reflected light may be expressed as the footcandle in footcandlefoot, which is equal to the illumination in footcandle multiplied by the reflectance. The GOLDEN CROWN is calibrated for a average reflectance of 18 percent.

For special purposes it may be desired to measure incident illumination in footcandlefoot and lightness (in candle foot per sq ft or footcandlefoot). To do this rotate the meter dial toward the top. Value numeral 1 appears exactly opposite the lower readout line in the window, as shown in the illustration. In this position, the scale numerals correspond to the photometric equivalents in the following table.



INCIDENT-LIGHT SCALE EQUIVALENTS (in footcandlefoot)

Scale Numeral	With Incident-Light Attachment			Scale Numeral	With Reflected-Light Attachment		
	Wide Range	Low Range	High Range		Wide Range	Low Range	High Range
1	0.68	8	100	1	0.95	0.4	4.4
2	0.16	17	200	2	0.56	0.8	12.8
3	0.33	33	400	3	0.17	1.4	24.0
4	0.44	50	800	4	0.23	3.2	52.0
5	1.3	100	1,600	5	0.30	4.4	104.0
6	2.6	200	3,200	6	1.6	12.8	208.0
7	5.2	400	6,400	7	2.0	24.0	416.0
8	10.4	800	12,800	8	4.0	52.0	832.0
9	20.8	1,600	25,600	9	8.0	104.0	1,664.0

*If the value for reflected light is required in footcandle, multiply candlefoot, ft. by 8 (-3.14)
See page 27.

Calibration Data

The exposure required to photograph an average subject is given by the formula:

Incident Light	CAE T ₁ = CAE / F ²	Reflected Light	KAE T ₂ = KAE / F ²
T = Exposure time in seconds	A = Relative aperture, or f-number of lens	R = Film exposure index	B = Object brightness, reflected light, in candle foot per square foot
I = Incident light in footcandle	K = f ² × ASA calibration constant, reflected light	C = 15; ASA calibration constant, incident light	

Acceptance

Specific acceptance angle of the meter arc:

LO range	horizontal ±40°	vertical ±17°	HI range	horizontal ±30°	vertical ±17°
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HOW TO CARE FOR YOUR GOLDEN CROWN EXPOSURE METER


Your GOLDEN CROWN exposure meter is a precision instrument. It should receive the same careful handling and treatment that are given to an expensive camera or any fine precision instrument.

Your meter has been assembled with machinery's skill and should not, under any circumstances, be tampered with or taken apart. It should not be subjected to prolonged heat or moisture.

Although your GOLDEN CROWN meter will withstand normal shock and handling, be particularly careful not to drop or bang it. A sack cord is provided with each meter. Your meter may be conveniently carried in the G.E. leather case.

Zero-set Adjustment

If your meter receives normal use and care, no special adjustments will be required. Periodically, however, the zero position may be checked as follows. Mark the light-cell window thoroughly. (Never use grease or tape on the window.) Press the pointer-lock button. The pointer should be as shown at right.



Correct any deviation by turning the zero-set adjustment (large screw in back-center of meter).

Exposure-meter Information

General Electric maintains an Exposure-meter Information Bureau and Spectrometric Laboratory. The purpose of this Bureau and Laboratory is to offer assistance in solving your exposure problems. Address all correspondence to: General Electric Company, Exposure-meter Information Bureau, 40 Federal St., West Lynn 3, Mass.

If your GOLDEN CROWN exposure meter requires servicing, return it to the nearest address listed below, after packing it carefully in a well-protected case.

General Electric Company, 40 Federal St., West Lynn 3, Mass.
 General Electric Company, 1265 Harrison St., San Francisco 3, Calif.
 General Electric Company, 320 Macon Way, Dallas, Texas
 International Correspondence Co., 641 W. Adams St., Chicago, Ill.
 Quality Electric Company, 370 S. Broadway, Los Angeles 1, Calif.
 Instrument Laboratories, 634 Elliot Ave., West, Seattle, Wash.

For Canadian users, send to:
 Canadian General Electric Company, Ltd., Industrial Center No. 5, Quebec City, P.Q., Canada.

For further notes:
 Contact your nearest International General Electric Company office for service literature.

Your General Electric GOLDEN CROWN exposure meter is warranted to be free from defects in material or workmanship for the lifetime of the device. If your meter requires servicing because of any defects in materials or workmanship, it will be serviced without charge. This warranty does not extend to servicing or repairs resulting from mis-handling or normal wear.

The obligation of the General Electric Company shall be limited to repairing or replacing the exposure meter and in no event shall it be liable for consequential damages.

Service

Warranty

FILM VALUES

Exposure index numbers for some of the most frequently used photographic films are given here.

Color Film	Emulsion	Sensitivity	Speed	Color
Kodachrome Super 8	Kodachrome Super 8	400	200	Color
Kodachrome Super 8	Kodachrome Super 8	200	100	Color
Kodachrome Super 8	Kodachrome Super 8	100	50	Color
Kodachrome Super 8	Kodachrome Super 8	50	25	Color
Kodachrome Super 8	Kodachrome Super 8	25	12.5	Color
Kodachrome Super 8	Kodachrome Super 8	12.5	6.25	Color
Kodachrome Super 8	Kodachrome Super 8	6.25	3.125	Color
Kodachrome Super 8	Kodachrome Super 8	3.125	1.5625	Color
Kodachrome Super 8	Kodachrome Super 8	1.5625	0.78125	Color
Kodachrome Super 8	Kodachrome Super 8	0.78125	0.390625	Color

BLACK AND WHITE FILM

Film	Emulsion	Sensitivity	Speed	Color
Kodachrome Super 8	Kodachrome Super 8	400	200	Color
Kodachrome Super 8	Kodachrome Super 8	200	100	Color
Kodachrome Super 8	Kodachrome Super 8	100	50	Color
Kodachrome Super 8	Kodachrome Super 8	50	25	Color
Kodachrome Super 8	Kodachrome Super 8	25	12.5	Color
Kodachrome Super 8	Kodachrome Super 8	12.5	6.25	Color
Kodachrome Super 8	Kodachrome Super 8	6.25	3.125	Color
Kodachrome Super 8	Kodachrome Super 8	3.125	1.5625	Color
Kodachrome Super 8	Kodachrome Super 8	1.5625	0.78125	Color

BETTER PICTURES WITH YOUR GOLDEN CROWN EXPOSURE METER TYPE PR-3



GENERAL ELECTRIC